

## CLAIMS

What is claimed is:

1. A method of stable incremental layout of a hierarchical graph comprising:  
5 determining a level of the layout for each new node of the graph using information about hidden nodes of the graph;  
determining positions of nodes on levels of the layout using information about hidden nodes of the graph; and  
determining coordinates of new nodes in the layout without using information about  
10 hidden nodes.
2. The method of claim 1, further comprising inserting new levels of the layout between existing levels when a new level is needed to contain a new node.
3. The method of claim 2, wherein nodes on existing levels retain positions on the existing levels.
- 15 4. The method of claim 1, wherein the determining steps are performed to minimize visual changes in the layout as compared to an initial layout of the graph.
5. The method of claim 1, further comprising complying with quality criteria.
6. The method of claim 1, wherein the quality criteria comprises minimization of edge crossings of the layout.
- 20 7. The method of claim 1, wherein the quality criteria comprises minimization of back edges of the layout.
8. An article comprising: a storage medium having a plurality of machine accessible instructions, wherein when the instructions are executed by a processor, the instructions provide for stable incremental layout of a hierarchical graph by determining a level  
25 of the layout for each new node of the graph using information about hidden nodes of the graph, determining positions of nodes on levels of the layout using information about hidden nodes of the graph, and determining coordinates of new nodes in the layout without using information about hidden nodes.
9. The article of claim 8, further comprising instructions to insert new levels of the  
30 layout between existing levels when a new level is needed to contain a new node.
10. The article of claim 9, wherein nodes on existing levels retain positions on the existing levels.
11. The article of claim 8, wherein the determining instructions are executed to minimize visual changes in the layout as compared to an initial layout of the graph.
- 35 12. The article of claim 8, further comprising complying with quality criteria.

13. The article of claim 8, wherein the quality criteria comprises minimization of edge crossings of the layout.

14. The article of claim 8, wherein the quality criteria comprises minimization of back edges of the layout.

5 15. A method of stable incremental layout of a hierarchical graph having nodes and edges comprising:

generating an initial layout of the graph; and

generating, as a result of a change in the graph, an incremental layout of the graph based on the initial layout by performing

10 for each new node of the graph, determining a level of the incremental layout using information about hidden nodes of the graph, and inserting a new level in the incremental layout between existing levels when the new level is needed to contain the new node;

for each level, determining positions of new nodes on each level of the incremental layout using information about hidden nodes of the graph; and

15 for each level, determining coordinates of new nodes in the incremental layout without using information about hidden nodes.

16. The method of claim 15, wherein nodes on existing levels retain positions on the existing levels.

20 17. The method of claim 15, wherein the determining steps are performed to minimize visual changes in the incremental layout as compared to an initial layout of the graph.

18. The method of claim 15, further comprising complying with quality criteria, wherein the quality criteria comprises at least one of minimization of edge crossings, and minimization of back edges.

25 19. An article comprising: a storage medium having a plurality of machine accessible instructions, wherein when the instructions are executed by a processor, the instructions provide for stable incremental layout of a hierarchical graph by

generating an initial layout of the graph; and

30 generating, as a result of a change in the graph, an incremental layout of the graph based on the initial layout by performing

for each new node of the graph, determining a level of the incremental layout using information about hidden nodes of the graph, and inserting a new level in the incremental layout between existing levels when the new level is needed to contain the new node;

35 for each level, determining positions of new nodes on each level of the

incremental layout using information about hidden nodes of the graph; and

for each level, determining coordinates of new nodes in the incremental layout without using information about hidden nodes.

20. The article of claim 19, wherein the determining instructions are executed to  
5 minimize visual changes in the incremental layout as compared to an initial layout of the graph.

21. The article of claim 19, further comprising complying with quality criteria, wherein the quality criteria comprises at least one of minimization of edge crossings, and minimization of back edges.